

New Choices for Materials

- Better Products
- Product Use Reduction
- Materials in Technical Loops
- Services vs. Purchases

Better Products

Biomimicry is a simple idea that may someday catch on in a big way.

Simply put, biomimicry is the belief that the future of material design and use can be found in the design of the natural world around us.

- Spider Web (thread strength)
- Slug mucous (adhesive)
- Abalone Shell (protective shell)
- Barnacle (adhesives)
- Lotus flower (waterproofing)
- Geckos (small hairs as glue)
- Venus Flower basket
(better fiber optic cables)



Better Products- High-Volume Low-Pressure Spray Paint Guns

- Decreases the release of toxic chemicals
- Greater worker protection
- Decreases the amount of paint needed for greater cost savings
 - For conventional uses, can save up to \$13,000 on paint costs every year.

The PowerMate Eco by NEC



- 100% recyclable plastic
- Virtually no hazardous materials
- Uses 1/3 the amount of energy
- With 900MHz Crusoe processor, 20GB Hard Drive, and 15-in. display

Green Composite Plastic?

- Made of soybean protein and other biodegradable plastics and plant-based fibers
- Good insulation against noise
- Low in cost, fully biodegradable, and replenishable.
- Now used at Wild Oats nationally without an increase in their prices



Herman Miller's Mirra Chair

- PVC-free chair
- Ergonomic (Depth, back support, recline assist, tilt cc
- 42% recycled mate
- 96% recyclable/reu



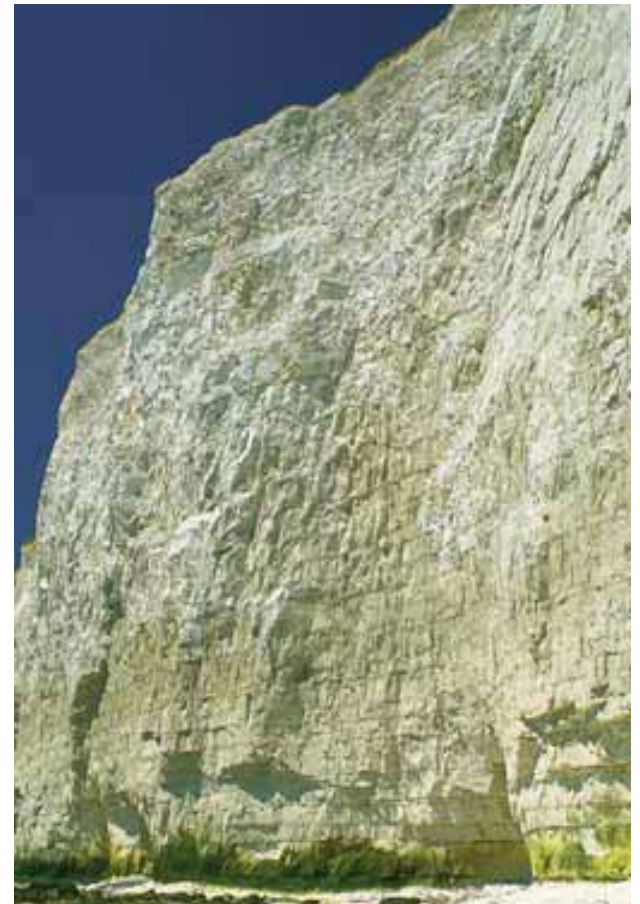
Bio-composite Fibers



- Biodegradable and compost-able fiber
- No output pollution and doesn't use petroleum-based chemicals for production
- Takes on the characteristics of its counterpart, but with inherent plastic protection.

Chalk Packaging

- ½ chalk, ½ plastic
- Neutralizes acid fumes and soil, when in waste incinerators
- Low power consumption from production



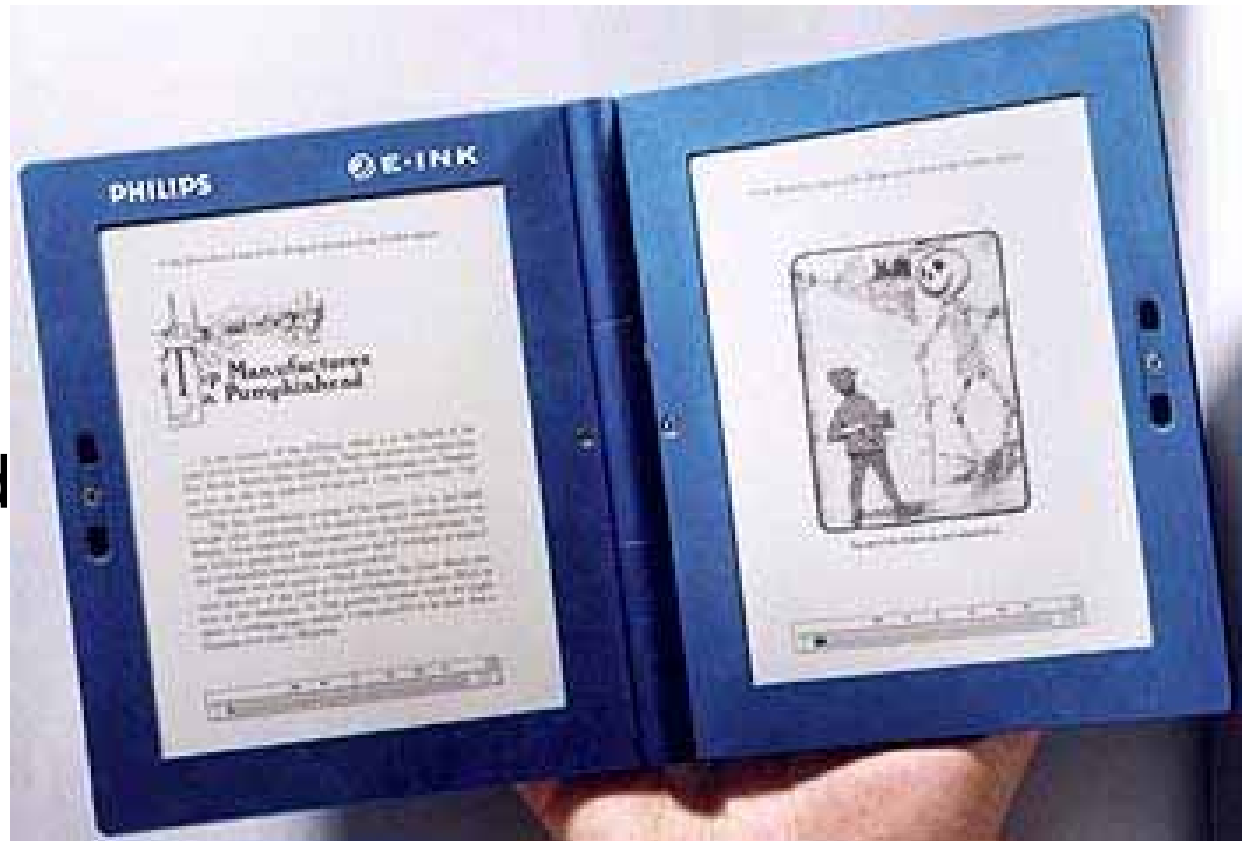
Product Use Reduction

Laser technology can also be used in facility maintenance.

- For architectural preservation of historical landmarks.
- Eliminates the use of chemical paint strippers
- Reduces the generation of hazardous waste created from abrasive blasting.
- For cleaning applications

E-Paper

- E-Ink – first prototype release this month
- 160 pixels/inch; .012 inches wide
- Paper-like readability and flexibility
- 5x brighter and uses 99% less power than LCD



Materials in a Technical Loop -

Fort Chaffee Building Deconstruction

- Partnership between Army and Habitat for Humanity
- Negotiated with Fort Chaffee Local Redevelopment Authority
- Over 600 large buildings (2 story WWII barracks)
- Large amount of salvageable siding, windows, doors
- Over 10 million board feet of old-growth yellow pine
- Value \$20-40M



Aggressive Waste Contracts

Rutgers Camden Campus recycles 20+ items through its contracted waste services.

Accomplished by:

- Writing gradually more comprehensive contracts
- Obtaining input from service providers
- Off-setting costs. Recycling makes a profit



Aggressive Waste Contracts – Part 2

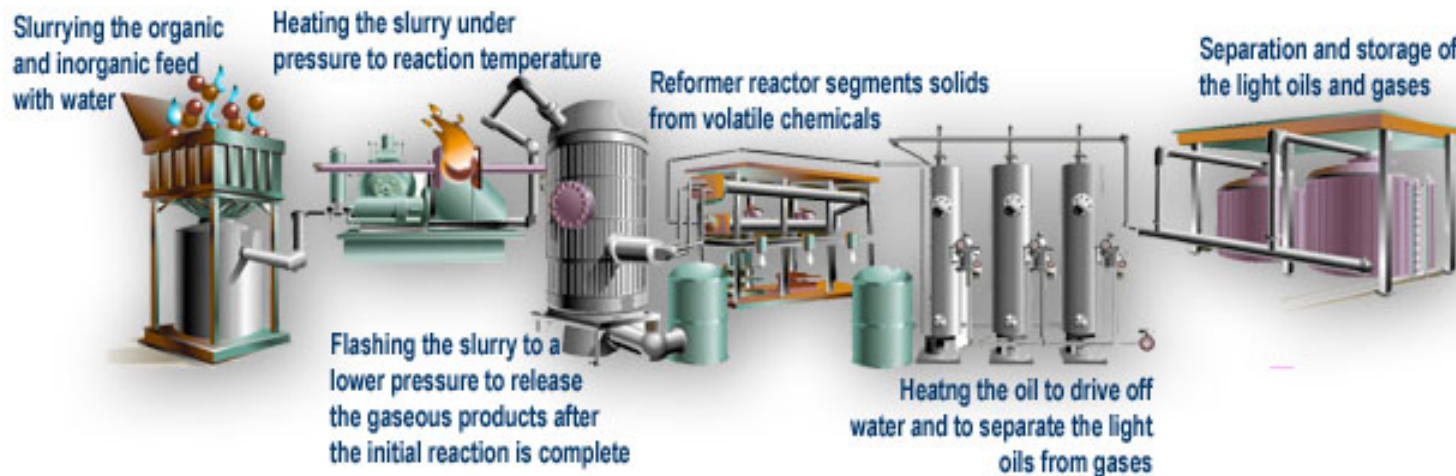
LA International Airport

- Pilot program with sewage and utility company to use its 19,000 tons of food scraps to create energy from methane
- Saves \$12/ton on disposal costs and receives \$18/ton for energy sales



Thermal Depolymerization Process

- A new machine that can turn almost anything into oil
- Turbo-charges normal processes by increasing temperature
- At worst, 85% energy efficiency for complex feedstocks
- Waste goes from a cost to a profit.
- Expected to be up and running by 2005 for commercial uses.



Homicronization

- Recycling Process for all plastics through thermomechanical ultra high shearing reactor technology
- Higher Quality plastic output – upcycling
- No chemical additives

Services vs. Purchases

- Interface Carpet
- Automobiles
- Furniture
- Red rags
- Paper?

Xerox –

- Recaptures 1.5 billion lbs. of equipment since lease program
- Eliminated hazardous waste from its products
- Saved over \$2 billion over the last decade.